

TITLE: MICROBIAL EFFICIENCY FOR BIOSOLUBILIZATION SILICATE ROCKS

AUTHORS: SOUZA, T.F.¹; REIS, D.P.²; OLIVEIRA, C.A.³; DINIZ, G. F. D.¹; de CASTRO, C. M.S.¹; MARRIEL, I.E.^{1,2,3}

INSTITUTION: ¹UNIVERSIDADE FEDERAL DE SÃO JOÃO DEL REI, CAMPUS DE SETE LAGOAS, MG (RODOVIA MG 424 – Km 47, CEP 35701-970, SETE LAGOAS- MG, BRAZIL); ²UNIVERSIDADE FEDERAL DE SÃO JOÃO DEL REI, SÃO JOÃO REI, MG (PRAÇA DOM HELVÉCIO, 74, CEP 36301-160, SÃO JOÃO DEL REI- MG, BRAZIL); ³EMBRAPA, SETE LAGOAS, MG (RODOVIA MG 424 KM 45, CEP 35701-970, SETE LAGOAS- MG).

ABSTRACT:

Brazilian agriculture consumes a large quantity of potassium (K), with a high dependence on imports, which raises production costs. On the other hand, the country has different types of silica rocks of low solubility, but with potential of agricultural use that could mitigate this external dependence. Therefore, the objective of this work was to evaluate and select strains of microorganisms as the biosolubilization capacity of silicate rocks. Initially been tested 58 bacteria and 12 fungi belonging to the collection of Multifunctional Microorganisms of the Embrapa Milho e Sorgo solubilization capacity of the verdete rock with two granulometry (1 a 4 mm and <4 µm) rock dust with shale smoke and basaltic rock dust, In plates containing solid culture medium and rocks as the sole source of potassium. After incubation of the plates for seven days, room temperature, The solubilization efficiency (SE) Was estimated by the rate between the diameter of the solubilization halo and the diameter of the colony. Four efficiency bands were considered: low efficiency (EI entre 0 e 2,0), median efficiency (EI entre 2,0 a 3,0) and efficient (IE>3,0). The efficiency of selected isolates (three of bacteria – BAC01, BAC02 e BAC03; two fungi -F01 e F02) was reevaluated in liquid culture medium. Aliquots of 100 µl of the bacterial suspension containing 10⁸ cell ml⁻¹ or three fungal colony discs were inoculated into flasks containing 50 ml of liquid culture medium and rock as the source of K, pH 6.5. The tests were performed in triplicate, with a control treatment (without inoculum). After 10 days of incubation under agitation and temperature of 28 ° C, The enriched cultures were filtered and analyzed for the potassium content in the supernatant by flame spectrophotometry. The results demonstrated that the bioavailability of potassium in the liquid medium varied significantly (p<0,05) between microorganisms, depending on the rock evaluated. Among bacteria, the potassium contents oscillated from 0 a 42,6 mg/L and for fungi the values between 0 e 43,28 mg/L. The most efficient microorganisms can be tested in soil-plant system to increase the supply of K from silicate rocks.

Keys words: bacteria, solubilization, fungi

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